



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR QUALITY
STATE STREET COMMONS
100 W. Water Street, Suite 6A
DOVER, DELAWARE 19904

Telephone: (302) 739 - 9402
Fax No.: (302) 739 - 3106

October 21, 2019

Associate Director
Office of Permits and Air Toxics (3AP10)
United States Environmental Protection Agency
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

ATTENTION: Ms. Mary Cate Opila
Acting Associate Director

Dear Ms. Opila:

Enclosed are final federally enforceable 7 **DE Admin. Code** 1102 Permits for the Delaware City Refining Company having a facility at 4550 Wrangle Hill Road, in Delaware City, Delaware. These federally enforceable 7 **DE Admin. Code** 1102 permits were issued in accordance with the requirements of 7 **DE Admin. Code** 1102 Section 11.2.10, 12.4 and 12.5. The Department will administratively amend the facility's Title V Permit (AQM-003/0016) to include all applicable requirements.

Sincerely,

A handwritten signature in blue ink that reads "Lindsay Rennie".

Lindsay Rennie
Environmental Engineer
Engineering & Compliance Branch

ADM:LTR
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pc: Dover (Title V) File
Angela D. Marconi
Lindsay Rennie
Matthew Willson – EPA Region III

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MEMORANDUM

TO: Angela D. Marconi, P.E., BCEE *ADM*

FROM: Lindsay Rennie *LR*

SUBJECT: **Delaware City Refining Company**
Final Federally Enforceable Permits
Permit: **APC-1990/0290 – OPERATION (Amendment 13)(FE)** – Boiler 3;
Permit: **APC-1990/0291 – OPERATION (Amendment 6)(FE)** – Boiler 4;
Permit: **APC-97/0503-OPERATION (Amendment 11)(NSPS)(FE)** – CCUs I and II; and
Permit: **APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE)** – FCCU

DATE: October 21, 2019

BACKGROUND

The Delaware City Refining Company requested amendments to operation permits of NO_x producing equipment on July 11, 2019. The Company would like the terms and conditions of **Permit: APC-1990/0290-OPERATION (Amendment 13)(FE)**, **Permit: APC-1990/0291 – OPERATION (Amendment 6)(FE)**, **Permit: APC-97/0503-CONSTRUCTION (Amendment 11)(NSPS)(FE)**, and **Permit: APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE)** made federally enforceable so they can be transferred to the Company's Title V Operating Permit (**AQM-003/00016 – Part 3 (Renewal 2)(Revision 4)**) via the administrative permit amendment process specified in 7 DE Admin. Code 1102 Sections 11.2.10, 12.4 and 12.5.

APPLICATION

A "Draft" of the federally enforceable construction permit was completed on July 1, 2019 and sent to the Delaware City Refining Company by email. Copies of the "Draft" federally enforceable construction permit and Memorandum were sent to Matthew Willson of the EPA Region III Office by e-mail on July 19, 2019. The States of Maryland, Pennsylvania, and New Jersey were given notice by email of the Department's intent to approve a federally enforceable construction permit for the Delaware City Refining Company on July 19, 2019. The "Draft" federally enforceable construction permit was advertised for public notice on Sunday, July 28, 2019 in the *Sunday News Journal* and the *Delaware State News*. The public comment period ended on August 26, 2019. Comments were submitted by Matthew Willson of the EPA Region III Office (EPA) on August 14, 2019, and comments and a request for a public hearing were submitted on August 26, 2019 by Mark Martell, President of the Delaware Audubon Society (AS). The Audubon Society withdrew its request for a public hearing on October 8, 2019. The Proposed federally enforceable construction permit was e-mailed to Matthew Willson on October 17, 2019. The EPA indicated that they did not have any objection to permit issuance on October 17, 2019.

RECOMMENDATION

I recommend that the attached federally enforceable construction permit be issued to the Delaware City Refining Company. In addition, I recommend that a copy of the federally enforceable construction permit shall be sent to EPA Region III.

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pc: Dover Title V File



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Fax No.: (302) 739 - 3106

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE 19706

Certified Mail # 9590 9402 4187 8121 1229 33
Return Receipt Requested

ATTENTION: Jeffery Coleman
Refinery Manager

SUBJECT: Permit: APC-1990/0290-OPERATION (Amendment 13)(FE) – Boiler 3;
Permit: APC-1990/0291 – OPERATION (Amendment 6)(FE) – Boiler 4;
Permit: APC-97/0503-CONSTRUCTION (Amendment 11)(NSPS)(FE) – CCUs I and II; and
Permit: APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE) – FCCU.

Dear Mr. Coleman:

The Department has completed processing the Delaware City Refining Company's requested permit amendments per the Settlement Agreement signed on July 11, 2019. Attached is the Delaware City Refining Company's final federally enforceable 7 **DE Admin. Code** 1102 Operation Permits.

As the designated Responsible Official for the Delaware City Refining Company, it is your responsibility to review, understand, and abide by all of the terms and conditions of the attached permits. It is also your responsibility to ensure that any person who operates any emission unit subject to any term or condition of the attached permit reviews, understands, and abides by the condition(s) of the attached permit that are applicable to that particular unit.

Within 12 months of the date of issuance of these permits, you must submit a request to the Department to transfer the terms and conditions of Permit: APC-1990/0290-OPERATION (Amendment 13)(FE), Permit: APC-1990/0291 – OPERATION (Amendment 6)(FE), Permit: APC-97/0503-CONSTRUCTION (Amendment 11)(NSPS)(FE), and Permit: APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE) into your Title V Permit (AQM-003/00016 – Part 2 (Renewal 1)(Revision 4) and Part 3 (Renewal 2)(Revision 4)) via the administrative permit amendment process. This request must contain the following:

- A description of the compliance status, a compliance schedule, and a certification of compliance for the equipment with respect to all applicable requirements in accordance with 7 **DE Admin. Code** 1130 Sections 5.4.8 and 5.4.9;
- A statement of the methods used to determine compliance, including a description of monitoring, record keeping, and reporting requirements and test methods; and
- A certification from you that declares, "I certify, based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete."

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Permit: **AQM-003/00016**
Delaware City Refining Company
October 21, 2019
Page 2

Please contact Lindsay Rennie at (302)323-4542 if you have any questions or concerns regarding the attached permit.

Sincerely,

A handwritten signature in dark ink, appearing to read "A. Marconi".

Angela D. Marconi, P.E., BCEE
Program Manager
Engineering & Compliance Branch

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pc: Dover (Title V) File
Lindsay Rennie



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Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and Induced Flue Gas Recirculation Projects
Delaware City Refinery

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE 19706

ATTENTION: Jeffery Coleman
Refinery Manager

Dear Mr. Coleman:

Pursuant to 7 **DE Admin. Code** 1102, Section 2.1.3, approval of the Department of Natural Resources and Environmental Control is hereby granted for the operation of Boilers 3 and 4 Steam Injection Project and Induced Flue Gas Recirculation (IFGR) Project on Riley Stoker Boiler 3 with a design heat input of 618 mmBtu/hour and Foster Wheeler Boiler 4 with a design heat input of 737 mmBtu/hour, located at the Delaware City Power Plant in the Delaware City Refinery in accordance with the following documents:

- Application submitted on Forms AQM-1, AQM-2, AQM-3.1 and AQM-5 dated April 12, 2013 and signed by Herman Seedorf;
- Application submitted on Forms AQM-1, AQM-2, AQM-3.1 and AQM-5 dated October 16, 2014 and signed by Jose Dominguez.
- Settlement Agreement dated July 11, 2019.

This permit is issued subject to the following conditions:

1. **General Provisions**

- 1.1. This permit expires 5 years from the date of issuance.
- 1.2. Representatives of the Department may, at any reasonable time, inspect this facility.
- 1.3. This permit may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. Approval (or disapproval) of the permit transfer will be provided by the Department in writing. A request for a permit

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Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 2

transfer shall be received by the Department at least 30 days before the date of the requested permit transfer. This request shall include:

- 1.3.1 Signed letters from each person stating the permit transfer is agreeable to each person; and
 - 1.3.2 An Applicant Background Information Questionnaire pursuant to 7 Del C. Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous 5 years.
- 1.4 The owner or operator shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 DE Admin. Code 1102, and, when applicable 1125, and receiving approval of such application from the Department; except as authorized by this permit or exempted in the Regulations.
- 1.5 The Company shall, upon completion of the construction, installation, or alteration of each emission unit, request in writing that the Department transfer the terms and conditions of this permit into the 7 **DE Admin. Code** 1130 operating permit. *[Reference 7 DE Admin. Code 1102 Section 11.5 dated 06/11/2006]*
- 1.6 The request shall contain the following information, and shall contain the following language from the responsible official: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete." *[Reference 7 DE Admin. Code 1102 Section 11.5.1 dated 06/11/2006]*
 - 1.6.1 A description of the compliance status, a complete schedule, and a certification of compliance for the equipment, facility, or air contaminant control device with respect to all applicable requirements, in accordance with 7 **DE Admin. Code** 1130 Section 5.4.8 and 5.4.9; and
 - 1.6.2 A statement of the methods used to determine compliance, including a description of the monitoring, record keeping, and reporting requirements and test methods.
- 1.7 Upon satisfactory demonstration that the equipment, facility, or air contaminant control device complies with all applicable requirements and all terms and conditions of the construction permit, and not prior to the expiration of the EPA review period provided for in 7 **DE Admin. Code** 1102, Section 12.5, the Department shall transfer the specified terms and conditions to the 7 **DE Admin. Code** 1130 permit via the administrative amendment process specified in 7 **DE Admin. Code** 1130. *[Reference 7 DE Admin. Code 1102 Section 11.5.2 dated 06/11/2006]*

2. Emission Limitations

- 2.1 For the purpose of this condition, "TPY" is defined as "tons emitted in any rolling twelve month period". Air contaminant emission levels from the operation of Boilers 2, 3, 4, and the CCUs, shall not exceed the following and those specified by 7 **DE Admin. Code** 1100:
 - 2.1.1 Nitrogen Oxides (NO_x) Emissions:

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 3

- 2.1.1.1 NO_x emissions shall not exceed those prescribed in Condition 3, Table 1a.5.i. of **Permit: AQM-003/00016 – Part 3 (Renewal 2)(Revision 3)** dated April 12, 2018.
- 2.1.1.2 NO_x emissions shall not exceed those achieved by proper operation of the boilers and associated Steam Injection and IFGR systems and 0.13 lb/mmBtu from each of Boilers 3 & 4 on a 24-hour rolling average.
- 2.1.1.3 The lb/mmBtu emissions standards for Boilers 3 & 4 in Condition 2.1.1.2 shall not apply during periods not to exceed 6 hours during each planned startup and shutdown. Instead, the boilers shall not exceed 0.2 lbs/mmbtu on a 24 hour average basis.
- 2.1.1.4 Condition 2.1.1.2 shall not apply during periods when the Steam Injection and/or IFGR is unavailable due to maintenance, malfunction, steam emergency or other abnormal steam demand scenarios for a period not to exceed 7 days as defined in Condition 3.3. Instead, the boilers shall not exceed 0.2 lbs/mmbtu on a 24 hour average basis.
- 2.1.2 Sulfur Dioxide (SO₂) Emissions:
SO₂ emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 306.4 TPY. SO₂ emissions shall not exceed the following unit specific limits: 71.2 TPY for Boiler 2, 61.4 TPY for Boiler 3.
- 2.1.3 Carbon Monoxide (CO) Emissions:
CO emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 470.2 TPY. CO emissions shall not exceed the following unit specific limits: 106.6 TPY for Boiler 2, and 92.0 TPY for Boiler 3. CO emissions shall not exceed 0.034 lb/mmBtu for Boiler 2 and 3 on a 24-hour rolling average basis
- 2.1.4 Particulate Matter (PM₁₀) Emissions:
 - 2.1.4.1 PM₁₀ emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 311.0 TPY (inclusive of 235.4 TPY H₂SO₄ mist from Boilers 2 & 3 and the CCUs). PM₁₀ emissions shall not exceed the following unit specific limits: 27.8 TPY for Boiler 2, and 92 TPY for Boiler 3.
 - 2.1.4.2 PM₁₀ emissions including H₂SO₄ shall not exceed the following limits:
 - 2.1.4.2.1 0.0104 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2, and 3.
- 2.1.5 Total Suspended Particles (TSP) Emissions:
 - 2.1.5.1 TSP emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 78.7 TPY. TSP emissions shall not exceed the following unit specific limits: 15.7 TPY for Boiler 2, and 13.5 TPY for Boiler 3.
 - 2.1.5.2 TSP emissions shall not exceed the following limits:
 - 2.1.5.2.1 0.0062 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2 and 3.
 - 2.1.5.2.2 [RESERVED]

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 4

- 2.1.6 Volatile Organic Compounds (VOC) Emissions:
 - 2.1.6.1 VOC emissions from the CCUs, Boilers 2, and 3 combined shall not exceed 22.7 TPY. VOC emissions shall not exceed the following unit specific limits: 4.4 TPY for Boiler 2, and 3.8 TPY for Boiler 3.
 - 2.1.6.2 VOC emissions shall not exceed the following limits:
 - 2.1.6.2.1 0.0014 lb/mmBtu when firing natural gas or refinery fuel gas in Boilers 2, and 3.
- 2.1.7 Sulfuric Acid (H_2SO_4) Emissions:

Emissions from the CCUs and Boiler 2, and 3 combined shall not exceed 235.4 TPY. H_2SO_4 emissions shall not exceed the following unit specific limits: 10.9 TPY for Boiler 2, 71.6 TPY for Boiler 3.
- 2.1.8 Lead (Pb) Emissions:

Pb emissions from the CCUs and Boiler 3 combined shall not exceed 0.02 tons on a rolling twelve month basis.
- 2.2 None of the boilers shall emit visible air contaminants exceeding 20% opacity for an aggregate of more than 3 minutes in any 1 hour period, or more than 15 minutes in any 24 hour period.
- 2.3 Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.

3. Operational Limitations:

- 3.1 Only desulfurized refinery fuel gas (RFG) with a hydrogen sulfide content less than 0.1 grain/dscf on a 3 hour rolling average and/or natural gas may be fired in Boilers 2, 3, and 4.
- 3.2 Except during periods of startup and shutdown, the burner steam injection systems and IFGR systems in Boilers 3 and 4 shall be working in a manner consistent with maintaining 0.13 lb/MMBtu NO_x on a 24 hour rolling average.
- 3.3 Except as provided by Condition 3.3.2, Boilers 3 and/or 4 shall not be operated unless the respective Steam Injection and IFGR systems are in use and operating properly whenever the systems are available. Compliance with the emission limitation in 2.1.1 shall constitute proper operation. The Owner/operator shall operate the IFGR system for each boiler in accordance with manufacturer's recommendations.
 - 3.3.1 The IFGR and/or Steam Injection systems are considered available except during periods of planned maintenance or malfunction as defined below or during periods of steam emergency or other abnormal steam demand scenarios.
 - 3.3.2 "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner, and that causes the source to exceed a technology based emission limitation under the permit, due to unavoidable increases in emissions attributable to the malfunction. An emergency or malfunction shall not include

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 5

3.3.3 noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error. Steam emergency/abnormal steam demand means an upset of the refinery steam header system resulting in the need for operating steam generating sources to significantly or rapidly adjust their loads to attempt to maintain or restore stable operations. Such periods shall not exceed 7 days in duration.

3.4 At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall maintain and operate the equipment and processes covered by this Permit, including all structural and mechanical components of all equipment and processes and all associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions.

4. Compliance Methodology, Testing and Monitoring Requirements

- 4.1 Compliance with Condition 2.1.1 for Boilers 2, 3, 4 and the CCUs shall be demonstrated using a Continuous Emissions Monitoring Systems (CEMS) for NO_x and O₂. The CEMS for Boilers 2, 3 and the CCUs shall conform to the applicable Performance Specifications in 40 CFR, Part 60, Appendix "B" and the Quality Assurance/Quality Control (QA/QC) procedures for NO_x CEMS in accordance with 40 CFR Part 60, Appendix "F". The CEMS for Boiler 4 shall conform to the applicable Performance Specifications in 40 CFR, Part 75, Appendix "A" and the Quality Assurance/Quality Control (QA/QC) procedures for NO_x CEMS in accordance with 40 CFR Part 75, Appendix "B".
- 4.2 Compliance with Condition 2.1.2 shall be demonstrated using the Refinery Fuel Gas H₂S Continuous Monitoring System (CMS) for emissions from Boilers 2 and 3. The CEMS shall conform to Performance Specification 2 in 40 CFR, Part 60, Appendix "B" and the Quality Assurance/Quality Control (QA/QC) procedures in accordance with 40 CFR Part 60, Appendix "F".
- 4.3 Compliance with Condition 2.1.3 shall be demonstrated by using CEMS on Boiler 2 and by a stack test based emissions factor and fuel flow rate for Boiler 3. The QA/QC procedures for the CO CEMS shall be established in accordance with the procedures in Appendix "F" of 40 CFR 60.
- 4.4 Compliance with Conditions 2.1.4, 2.1.5 and 2.1.6 shall be demonstrated by firing only natural gas or by using annual stack test based emissions factors while firing RFG and RFG fuel flow rates for the boilers.
- 4.5 Compliance with Condition 2.1.7 for Boilers 2 and 3 shall be demonstrated by applying the fuel gas monitored H₂S content to the H₂SO₄ conversion factor.
- 4.6 Compliance with Condition 2.1.8 shall be based on firing only natural gas or, desulfurized fuel gas.
- 4.7 Compliance with Conditions 2.2 for Boilers 2, 3 and 4 shall be based on COMS. The COMS shall conform to Performance Specification 1 in 40 CFR, Part 60, Appendix "B".

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 6

4.9 The Company shall conduct the following stack tests for Boiler 3 annually:

- 4.9.1 EPA Reference Method 5 for TSP
- 4.9.2 EPA Reference Method 5B/202 for PM₁₀, including H₂SO₄
- 4.9.3 EPA Reference Method 10 for CO except for Boiler 2
- 4.9.4 EPA Reference Method 25 A for VOC
- 4.9.5 EPA Reference Method 8 for H₂SO₄
- 4.9.6 Within 90 days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with the following general provisions:

4.9.6.1 One original and 2 copies of the test protocol shall be submitted a minimum of 30 days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.

4.9.6.2 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the compliance demonstration with the Air Surveillance and Engineering & Compliance Branches. The Department must observe the test for the results to be considered for acceptance, unless the Department determines in advance, in writing, that the test need not be observed. Further, the Department may in its discretion determine based on its observation of the test that it need not observe the entire test.

4.9.6.3 The final results of the testing shall be submitted to the Department within 90 days of the test completion. One original and 2 copies of the test report shall be submitted to the addresses below:

Original and One Copy to:

Engineering & Compliance Group
Attn: Assigned Engineer
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

One Copy to:

Air Surveillance Group
Attn: Program Manager
715 Grantham Lane
New Castle, DE 19720

4.9.6.4 To be considered valid, the final results report shall include the emissions test report (including raw data from the test) as well as a summary of the results and a statement of compliance or non-compliance with permit conditions signed by a member of the Company's Health, Safety and Environment department.

4.9.6.5 The results must demonstrate to the Department's satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 7

4.9.6.6 The Company may petition the Department for less frequent testing if future data shows that testing on an annual basis is unwarranted.

- 4.10 Compliance with Condition 3.1 shall be based on an instrument installed for continuously monitoring and recording the concentration (dry basis) of H₂S in RFG before it is combusted in any fuel burning device. The instrument shall be located downstream of all process steps which impact the composition of RFG prior to its being combusted in any fuel burning device. This instrument shall conform to the QA/QC requirements of Appendix "F" in 40 CFR 60. The H₂S monitor shall conform to Performance Specification 7 of 40 CFR 60, Appendix "B". Method 11 of 40 CFR 60, Appendix "A" shall be used for conducting the relative accuracy evaluations.
- 4.11 Compliance with Condition 3.2 shall be based on the record keeping requirements.
- 4.12 Department representatives shall be given the opportunity to witness all stack emission testing and monitor certification testing including any test audits conducted on the monitors as part of the Quality Assurance Program.
- 4.13 Compliance with Conditions 2.3 and 3.3 shall be based on information available to the Department, which may include, but is not limited to, monitoring results, opacity and process operating data.

5. Record Keeping Requirements

- 5.1 The Company shall maintain all records necessary for determining compliance with this permit in a readily accessible location for 5 years and shall make these records available to the Department upon written or verbal request.
- 5.2 The following records shall be maintained for a period of 5 years:
 - 5.2.1 Log of all operating hours of each boiler clearly showing the hours of operation with different fuel types, i.e., hours of operation with natural gas, refinery fuel gas, and the amount of each fuel type consumed;
 - 5.2.2 Rolling 24-hour heating values of the fuels combusted;
 - 5.2.3 Opacity readings recorded by the COMS;
 - 5.2.5 Log of daily qualitative stack observations for the package boilers
 - 5.2.6 CEMS data including calibration log and results of all Cylinder Gas Audits and all Relative Accuracy Test Audits.

6. Reporting Requirements

- 6.1 Emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department immediately upon discovery and after activating the appropriate site emergency plan, in the following manner:
 - 6.1.1 By calling the Department's Environmental Emergency Notification and Complaint number (800) 662-8802, if the emission poses an imminent and substantial danger to public health, safety or the environment.
 - 6.1.2 Other emissions in excess of any permit condition or emissions which create a condition of air pollution may be called in to the Environmental Emergency Notification and Complaint number (800) 662-8802 or faxed to (302)739-2466.

Delaware City Refining Company

Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects

Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3

Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4

October 21, 2019

Page 8

The ability to fax in notifications may be revoked upon written notice to the Company by the Department in its sole discretion.

- 6.1.3 In addition to complying with Conditions 6.1.1 and 6.1.2 of this permit, the Owner/Operator shall satisfy any reporting required by the "Reporting of a Discharge of a Pollutant or an Air Contaminant" regulation, within 30 calendar days of becoming aware of an occurrence subject to reporting pursuant to these conditions. All reports submitted to the Department shall be submitted in writing and shall include the following information:
- 6.1.3.1 The name and location of the facility;
 - 6.1.3.2 The subject sources that caused the emissions;
 - 6.1.3.3 The time and date of the first observation of the excess emissions;
 - 6.1.3.4 The cause and expected duration of the excess emissions;
 - 6.1.3.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission or operational limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
 - 6.1.3.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
- 6.1.4 Emissions on the same day from the same emission unit may be combined into one report. Emissions from the same cause that occur contemporaneously may also be combined into one report. The Owner/Operator shall submit an electronic copy of all required reports to the Department's compliance engineer assigned to the Refinery.

- 6.2 The Company shall comply with the following semi-annual excess emissions reports. The reports for the preceding semi-annual period shall be submitted to the Department by January 31 and July 31 of each calendar year with a summary of all excess emissions for the semi-annual period. The summary shall include:

- 6.2.1 The name and location of the facility;
- 6.2.2 The subject sources that caused the excess emissions;
- 6.2.3 The time and date of the first observation of the excess emissions;
- 6.2.4 The cause and expected duration of the excess emissions;
- 6.2.5 The estimated amount of emissions (expressed in the units of applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- 6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
- 6.2.7 All periods of opacity exceedances.

- 6.3 Send one (1) original to:

The Program Administrator
Division of Air Quality
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

and one (1) copy of all required reports to:

Delaware City Refining Company
Delaware City Power Plant – Boilers 3 & 4 Steam Injection and IFGR Projects
Permit: APC-90/0290-OPERATION (Amendment 13)(FE) – Boiler 3
Permit: APC-90/0291-OPERATION (Amendment 6)(FE) – Boiler 4
October 21, 2019
Page 9

Program Manager
Engineering and Compliance Group
715 Grantham Lane
New Castle, DE 19720

7. Administrative Conditions

- 7.1 This permit shall be available on the premises.
- 7.2 This permit authorizes the operation of the equipment authorized to be constructed by **Permit: APC-90/0290-CONSTRUCTION (Amendment 10) – Boiler 3** and **Permit: APC-90/0291-CONSTRUCTION (Amendment 3) – Boiler 4** dated July 15, 2103 and supersedes **Permit: APC-90/0290-OPERATION (Amendment 10) – Boiler 3**, & **Permit: APC-90/0291-OPERATION (Amendment 3) – Boiler 4** dated May 19, 2014, and **Permit: APC-90/0290-CONSTRUCTION/OPERATION (Amendment 12) – Boiler 3**, & **Permit: APC-90/0291-CONSTRUCTION/OPERATION (Amendment 5) – Boiler 4** dated January 15, 2015.
- 7.3 Failure to comply with the provisions of this permit constitutes good cause for suspension or revocation of this permit.

Sincerely,



Angela D. Marconi, P.E., BCEE
Program Manager
Engineering & Compliance Branch

ADM:LTR
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pc: Dover Title V File
Dawn Minor
Lindsay Rennie



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR QUALITY
STATE STREET COMMONS
100 W. Water Street, Suite 6A
DOVER, DELAWARE 19904

Telephone: (302) 739 - 9402
Fax No.: (302) 739 - 3106

October 21, 2019

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)
Delaware City Refinery
CCU I and II Selective Catalytic Reduction (SCR) System Project

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE 19706

ATTENTION: Jeffery Coleman
Refinery Manager

Dear Mr. Coleman:

Pursuant to 7 DE Admin. Code 1102, Section 2.1.3, approval of the Department of Natural Resources and Environmental Control is hereby granted for the modification of two (2) combined cycle units (CCUs) each consisting of a General Electric Model PG6101FA Gas Turbine rated at 780 mmBtu/hour (HHV) with a Natural Gas/Refinery Fuel Gas Fired Duct Burner (DB) rated at 192 mmBtu/hr (HHV), a Nooter Erikson Heat Recovery Steam Generator (HRSG) and electric generator rated at 77 MW nominal by the installation of a Turner Envirologic Inc. Selective Catalytic Reduction (SCR) System downstream of each HRSG located at the Delaware City Refinery's Delaware City Power Plant, Delaware City, Delaware in accordance with the following documents:

- Application submitted on Forms AQM-1, AQM-2, AQM-3.1, AQM-4.9 and AQM-5 dated October 23, 2013 and signed by Herman Seedorf.
- Electronic mails to Ravi Rangan from Larry Boyd dated 03.18.2014 and 03.27.2014 and electronic mail to Ravi Rangan from Thomas Godlewski dated 03.28.2014.
- Settlement Agreement dated July 11, 2019.

This permit is issued subject to the following conditions:

1. **General Provisions**

- 1.1. The CCU SCR Project shall be constructed in accordance with the application and this permit. If any changes are necessary, revised plans must be submitted and supplemental approval issued prior to actual construction. Construction authorization expires 3 years after issuance of this permit.
- 1.2. Representatives of the Department may, at any reasonable time, inspect this facility.
- 1.3. This permit may not be transferred to another location or to another piece of equipment or process.

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Permit: APC-97/0503-CONSTRUCTION/OPERATTION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 2

- 1.4. This permit may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. Approval (or disapproval) of the permit transfer will be provided by the Department in writing. A request for a permit transfer shall be received by the Department at least 30 days before the date of the requested permit transfer. This request shall include:
 - 1.4.1 Signed letters from each person stating the permit transfer is agreeable to each person; and
 - 1.4.2 An Applicant Background Information Questionnaire pursuant to 7 Del C, Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous 5 years.
- 1.5 A separate application to operate pursuant to 7 **DE Admin. Code** Regulation No. 1102 does not need to be submitted to the Department for the equipment or process covered by this permit. The Company shall notify the Department within 5 days of the completion of the construction of the CCU Modification Project and shall schedule an on-site system inspection within 30 days
- 1.6 The provisions of 7 **DE Admin. Code** 1102, Sections 2.1 and 11.3 shall not apply to the operation of equipment or processes for the purposes of initially demonstrating satisfactory performance to the Department of the Steam System Reliability Improvement Project following construction, installation, modification, or alteration of the equipment or processes.
- 1.7 The Company shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 **DE Admin. Code** 1102, and, when applicable 7 **DE Admin. Code** 1125, and receiving approval of such application from the Department; except as authorized by this permit or exempted in 7 **DE Admin. Code** Regulation No. 1102 Section 2.2.
- 1.8 The Company shall, upon completion of the construction, installation, or alteration of each emission unit, request in writing that the Department transfer the terms and conditions of this permit into the 7 **DE Admin. Code** 1130 operating permit. *[Reference 7 DE Admin. Code 1102 Section 11.5 dated 06/11/2006]*
- 1.9 The request shall contain the following information, and shall contain the following language from the responsible official: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete." *[Reference 7 DE Admin. Code 1102 Section 11.5.1 dated 06/11/2006]*
 - 1.9.1 A description of the compliance status, a complete schedule, and a certification of compliance for the equipment, facility, or air contaminant control device with respect to all applicable requirements, in accordance with 7 **DE Admin. Code** 1130 Section 5.4.8 and 5.4.9; and
 - 1.9.2 A statement of the methods used to determine compliance, including a description of the monitoring, record keeping, and reporting requirements and test methods.

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 3

- 1.10 Upon satisfactory demonstration that the equipment, facility, or air contaminant control device complies with all applicable requirements and all terms and conditions of the construction permit, and not prior to the expiration of the EPA review period provided for in 7 DE Admin. Code 1102, Section 12.5, the Department shall transfer the specified terms and conditions to the 7 DE Admin. Code 1130 permit via the administrative amendment process specified in 7 DE Admin. Code 1130. *[Reference 7 DE Admin. Code 1102 Section 11.5.2 dated 06/11/2006]*

2. Emission Limitations

- 2.1 Air contaminant emission levels from each CCU shall not exceed the following and those specified by 7 DE Admin. Code 1100¹:
- 2.1.1 Nitrogen Oxides (NO_x) Emissions:
- 2.1.1.1 NO_x emissions from each CCU shall not exceed following:
- 2.1.1.1.1 15 ppmvd @ 15% O₂ on an hourly average when CCU fires natural gas without duct firing.
- 2.1.1.1.2 18 ppmvd @ 15% O₂ on an hourly average when CCU fires natural gas with duct firing.
- 2.1.1.1.3 3 ppmvd @ 15% O₂ on a 24 hour average when CCU fires natural gas without duct firing.
- 2.1.1.1.4 3.6 ppmvd @ 15% O₂ on a 24 hour average when CCU fires natural gas with duct firing.
- 2.1.1.2 The owner/operator must comply with the "Facility-wide Emission Limit for Nitrogen Oxides (NO_x)" contained in Part 1, Condition 3, Table 1.j of Permit: AQM-003/00016.
- 2.1.1.3 The NO_x Emission Limitation of 2.1.1.1.3 and 2.1.1.1.4 shall not apply during periods of planned maintenance of the SCR, when the SCR is unavailable due to malfunction as defined in Condition 3.2.3, or when a petition has been approved in accordance with Condition 2.1.1.4.3.
- 2.1.1.4 DCRC may submit to DNREC a petition requesting approval through this permit of an alternative to the NO_x emission limitation found in 2.1.1.1.3 and 2.1.1.1.4 subject to the following limitations:
- 2.1.1.4.1 DCRC shall electronically submit the petition to the Department within three business days of the facility's determination to operate under a temporary alternative limit pursuant to the provisions of this Condition 2.1.1.4. The petition shall include an explanation of both the basis for and duration of the proposed alternative NO_x emission limit, as well as such back-up information as may be necessary to justify the petition

¹ For the purpose of this condition, "TPY" is defined as "tons emitted in any rolling twelve month period". All lb/mmBtu limits shall be on an hourly basis.

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 4

2.1.1.4.2 The proposed alternative limit shall not exceed 15 ppm on NG without duct firing and 18 ppm on NG with duct firing both at 15% O₂ on an hourly rolling average basis as identified in Condition 2.1.1.1.1 and 2.1.1.1.2.

2.1.1.4.3 If DNREC approves the petition, the alternative limit proposed by DCRC under 2.1.1.4 shall apply no earlier than 3 business days prior to receipt of the petition containing the information necessary for DNREC to make the determination set out in 2.1.1.4.1 and shall extend through the duration authorized by DNREC.

2.1.1.4.4 Approval by the Department of the petition in whole or in part will not be granted unless the company has demonstrated in detail why a temporarily increased limit, subject to 2.1.1.4.2 will result in the emission of less NO_x than alternative measures the refinery may otherwise take under its existing permits; and DNREC determines the temporary increase is appropriate, in its discretion, based on the entirety of the circumstances.

2.1.1.5 Operation in accordance with Condition 2.1.1.3 or 2.1.1.4 shall constitute compliance with Conditions 3.2 and 3.4.

2.1.2 Sulfur Dioxide (SO₂) Emissions:

2.1.2.1 36.5 TPY

2.1.3 Carbon Monoxide (CO) Emissions:

2.1.3.1 0.0202 lb/mmBtu when firing NG in the CCUs

2.1.2.2 0.0261lb/mmBtu when firing NG in the CCUs and RFG in the DBs

2.1.2.3 110.9 TPY

2.1.4 Particulate Matter (PM₁₀) Emissions (including H₂SO₄) as measured by the average of the three stack test runs conducted pursuant to Condition 4.3:

2.1.4.1 0.0074 lb/mmBtu when firing NG in the CCUs

2.1.4.2 0.0099 lb/mmBtu when firing NG in the CCUs and RFG in the DBs

2.1.4.3 67 TPY

2.1.5 Total Suspended Particles (TSP) Emissions as measured by the average of the three stack test runs conducted pursuant to Condition 4.3:

2.1.5.1 0.0115 lb/mmBtu when firing NG in the CCUs

2.1.5.2 0.0112 lb/mmBtu when firing NG in the CCUs and RFG in the DBs

2.1.5.3 47.8 TPY

2.1.6 Volatile Organic Compounds (VOC) Emissions as measured by the average of the three stack test runs conducted pursuant to Condition 4.3:

2.1.6.1 0.0021 lb/mmBtu when firing NG in the CCUs

2.1.6.2 0.0046 lb/mmBtu when firing NG in the CCUs and RFG in the DBs

2.1.6.3 19.8 TPY

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATTION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 5

- 2.1.7 Sulfuric Acid (H_2SO_4) Emissions as measured by the average of the three stack test runs conducted pursuant to Condition 4.3:
4.1 TPY
- 2.1.8 Lead (Pb) Emissions:
0.004 TPY
- 2.1.9 Ammonia (NH_3) Emissions:
5 ppmvd @ 15 % O_2 and 34.3 TPY
- 2.2 Neither CCU shall emit visible air contaminants exceeding 20% opacity for an aggregate of more than 3 minutes in any 1 hour period, or more than 15 minutes in any 24 hour period.
- 2.3 Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.

3. Operational Limitations:

- 3.1 Only NG may be fired in the combustion chambers of the CCUs. Only NG or desulfurized RFG with a hydrogen sulfide content less than 0.1 grain/dscf on a 3-hour rolling average may be fired in the DBs.
- 3.2 Except as provided by Conditions 2.1.1.3, 2.1.1.4, and 3.3.2, the CCUs shall not be operated unless the LNBs and SCR systems (when SCR is available) are operating properly. Compliance with the emission limitations in 2.1.1 shall constitute proper operation.
 - 3.2.1 The owner or operator shall operate the SCR system for each CCU in accordance with manufacturer's recommendations. Each SCR system shall be operated at all times that it is available, excluding periods of startup, shutdown, or malfunction.
 - 3.2.2 The SCR system is considered available except during periods of planned maintenance or malfunction as defined in Condition 3.2.3 of the SCR system.
 - 3.2.3 "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner, and that causes the source to exceed a technology based emission limitation under the permit, due to unavoidable increases in emissions attributable to the malfunction. An emergency or malfunction shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
- 3.3 During startup and shutdowns of the combustion turbines and/or duct burners the following exceptions shall apply:
 - 3.3.1 CO emissions concentration limitations specified in Condition 2.1.3 shall not apply for two hours following startup or for two hours preceding shutdown of the combustion turbines and/or duct burners. The Company shall follow good air pollution control practices to minimize CO emissions during these periods.
 - 3.3.2 NO_x emission rates from the CCUs shall not exceed 390 ppmv(dry) at 15 % O_2 for a period of 24 hours after initial startup of the CCU.

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 6

3.4

3.4.1 At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall, to the extent practicable, maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.

3.4.2 All structural and mechanical components shall be maintained in proper operating condition.

4. Compliance Methodology, Testing and Monitoring Requirements

4.1 Compliance with Condition 2.1.1 shall be demonstrated using a Continuous Emissions Monitoring Systems (CEMS) for NO_x and O₂. The CEMS shall conform to the applicable Performance Specifications in 40 CFR, Part 60, Appendix "B" and the Quality Assurance/Quality Control (QA/QC) procedures for NO_x CEMS in accordance with 40 CFR Part 60, Appendix "F".

4.2 Compliance with Condition 2.1.3 shall be demonstrated by using CEMS on the CCUs.

4.3 Compliance with Conditions 2.1.4, 2.1.5, 2.1.6, and 2.1.7 shall be demonstrated using annual stack test based emissions factors and fuel flow rates for the CCUs and duct burners.

4.4 Compliance with Conditions 2.1.2 and 2.1.8 shall be based on firing only NG in the CCUs and either NG or desulfurized RFG in the DBs.

4.5 Compliance with Condition 2.1.9 shall be based on monitoring the stack gas by obtaining weekly grab samples from a location downstream of the SCR system using a department approved method. The Company may request the Department for approval of less frequent monitoring if 24 consecutive sampling events indicate the ammonia slip to be less than 2 ppmvd @ 15 % O₂.

4.6 Compliance with Conditions 2.2 shall be based on daily qualitative stack observations to determine the presence of any visible emissions when the units are in operation.

4.6.1 If visible emissions are observed, the Company shall take corrective actions and/or conduct a visible observation in accordance with Paragraph 4.6.3 below.

4.6.2 If no visible emissions are observed, no further action is required.

4.6.3 If required under Condition 4.6.3 above, the Company shall, in accordance with Subsection 1.5(c) of Regulation No. 20, conduct visual observations at fifteen-second intervals for a period of not less than one hour except that the observations may be discontinued whenever a violation of the standard is recorded. The additional procedures, qualification and testing to be used for visually determining the opacity shall be those specified in Section 2 & 3 (except for Section 2.5 and the second sentence of Section 2.4) of Reference Method 9 set forth in Appendix A, 40 CFR, Part 60, revised July 1, 1982.

4.7 The Company shall conduct the following stack tests annually:

4.7.1 EPA Reference Method 5 for TSP

4.7.2 EPA Reference Method 5B/202 for PM₁₀, including H₂SO₄

4.7.3 EPA Reference Method 25 A for VOC

4.7.4 EPA Reference Method 8 for H₂SO₄

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 7

- 4.7.5 Within 90 days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with the following general provisions:

- 4.7.5.1 One original and 2 copies of the test protocol shall be submitted a minimum of 30 days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.
- 4.7.5.2 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the compliance demonstration with the Air Surveillance and Engineering & Compliance Branches. The Department must observe the test for the results to be considered for acceptance, unless the Department determines in advance, in writing, that the test need not be observed. Further, the Department may in its discretion determine based on its observation of the test that it need not observe the entire test.
- 4.7.5.3 The final results of the testing shall be submitted to the Department within 60 days of the test completion. One original and 2 copies of the test report shall be submitted to the addresses below:

Original and One Copy to:

Engineering & Compliance Branch
Attn: Assigned Engineer
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

One Copy to:

Air Surveillance Branch
Attn: Program Manager
715 Grantham Lane
New Castle, DE 19720

- 4.7.5.4 To be considered valid, the final results report shall include the emissions test report (including raw data from the test) as well as a summary of the results and a statement of compliance or non-compliance with permit conditions signed by a member of the Company's Health, Safety and Environment department.
- 4.7.5.5 The results must demonstrate to the Department's satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.
- 4.7.5.6 The Company may petition the Department for less frequent testing if future data shows that testing on an annual basis is unwarranted.
- 4.8 Compliance with Condition 3.1 with respect to the H₂S concentration in RFG shall be based on a continuous monitoring device. This instrument shall be installed for continuously monitoring and recording the concentration (dry basis) of H₂S in RFG before it is combusted in any fuel burning device. The instrument shall be located downstream of all process steps which impact the composition of RFG prior to its being combusted in any fuel burning

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 8

device. These instruments shall conform to the QA/QC requirements of Appendix "F" in 40 CFR 60.

- 4.9 Compliance with Conditions 3.2 through 3.4 shall be based on the record keeping requirements and on information available to the Department, which may include, but is not limited to, monitoring results, opacity and process operating data.
- 4.10 Department representatives shall be given the opportunity to witness all stack emission testing and monitor certification testing including any test audits conducted on the monitors as part of the Quality Assurance Program.

5. Record Keeping Requirements

- 5.1 The Company shall maintain all records necessary for determining compliance with this permit in a readily accessible location for 5 years and shall make these records available to the Department upon written or verbal request.
- 5.2 The following records shall be maintained for a period of 5 years:
 - 5.2.1 Log of all operating hours of each CCU and DB;
 - 5.2.2 Rolling 24-hour heating value of the RFG combusted;
 - 5.2.3 All 3-hour rolling averages of the H₂S content in RFG as measured by the H₂S analyzer;
 - 5.2.4 CEMS data including calibration log and results of all Cylinder Gas Audits and all Relative Accuracy Test Audits.

6. Reporting Requirements

- 6.1 Emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department immediately upon discovery and after activating the appropriate site emergency plan, in the following manner:
 - 6.1.1 By calling the Department's Environmental Emergency Notification and Complaint number (800) 662-8802, if the emission poses an imminent and substantial danger to public health, safety or to the environment.
 - 6.1.2 Other emissions in excess of any permit condition or emissions which create a condition of air pollution may be called in to the Environmental Emergency and Complaint number (800) 662-8802 or faxed to (302) 739-2466. The ability to fax in notifications may be revoked upon written notice to the Company by the Department in its sole discretion.
- 6.2 In addition to complying with Condition 6.1 of this permit, the Owner/Operator shall satisfy any reporting required by the "Reporting of a Discharge of a Pollutant or an Air Contaminant" regulation, within 30 days of becoming aware of an occurrence subject to reporting pursuant to these conditions. All reports submitted to the Department shall be submitted in writing and shall include the following information:
 - 6.2.1 The name and location of the facility;
 - 6.2.2 The subject source(s) that caused the excess emissions;
 - 6.2.3 The time and date of the first observation of the excess emissions;
 - 6.2.4 The cause and expected duration of the excess emissions;

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 9

- 6.2.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
 - 6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
 - 6.2.7 Emissions on the same day from the same emission unit may be combined into one report. Emissions from the same cause that occur contemporaneously may also be combined into one report.
 - 6.2.8 The Company shall submit an electronic copy of all required reports to the Department's compliance engineer assigned to the Refinery.
- 6.3 Except in circumstances when the owner/operator receives approval for a petition submitted pursuant to Condition 2.1.1.4, the owner/operator shall notify the Department within thirty (30) days of a determination that an SCR system governed by this permit will be unavailable for a period exceeding 2 consecutive calendar days.
- 6.3.1 Such notifications shall include:
 - 6.3.1.1 Reason for unavailability of SCR.
 - 6.3.1.2 Anticipated duration of unavailability of SCR.
 - 6.3.1.3 Steps being taken to minimize duration of unavailability and magnitude of emissions during this period.
 - 6.3.1.4 Alternatives considered.
 - 6.3.1.5 Anticipated effect of unavailability of SCR on compliance with NOx cap.
- 6.4 Send one (1) original to:
- Director
 - Division of Air Quality
- State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904
and one (1) copy of all required reports to:
- Program Manager
 - Engineering and Compliance Branch
 - Air Quality Management Section
 - 715 Grantham Lane
 - New Castle, DE 19720

Delaware City Refining Company

Permit: APC-97/0503-CONSTRUCTION/OPERATION (Amendment 11)(NSPS)(FE)

CCU I and II SCR Project

October 21, 2019

Page 10

7. Administrative Conditions

- 7.1 This permit shall be available on the premises.
- 7.2 The Company shall notify the Department in writing prior to making any material changes which cause these units to fall under the authority of Title IV of the Clean Air Act.
- 7.3 Failure to comply with the provisions of this permit constitutes good cause for suspension or revocation of this permit.
- 7.4 This permit authorizes the operation of the equipment authorized to be constructed by **Permit: APC-97/0503-CONSTRUCTION (Amendment 10)(NSPS) – CCUs I and II** dated July 2, 2014 and supersedes **Permit: APC-97/0503-OPERATION (Amendment 8)(NSPS) – CCUs I and II** dated July 3, 2012.

Sincerely,



Angela D. Marconi, P.E., BCEE
Program Manager
Engineering & Compliance Branch

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pc: Dover Title V File
Dawn Minor
Lindsay Rennie



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR QUALITY
STATE STREET COMMONS
100 W. Water Street, Suite 6A
DOVER, DELAWARE 19904

October 21, 2019

Telephone: (302) 739 - 9402
Fax No.: (302) 739 - 3106

**Permit: APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE)
Fluid Catalytic Cracking Unit (FCCU), FCCU Carbon Monoxide Boiler, FCCU COB Selective
Non-Catalytic Reduction (SNCR) System and Wet Gas Scrubber System**

Delaware City Refining Company
4550 Wrangle Hill Road
Delaware City, DE 19706

ATTENTION: Jeffery Coleman
Refinery Manager

Dear Mr. Coleman:

Pursuant to 7 **DE Admin. Code** 1102 Section 2, approval of the Department of Natural Resources and Environmental Control (Department) is hereby granted for the operation of the Fluid Catalytic Cracking Unit (FCCU), its Carbon Monoxide Boiler (COB), its Hamon-Research-Cottrell Selective Non-Catalytic Reduction (SNCR) System in the FCCU COB and the Wet Gas Scrubber (WGS) train consisting of a Belco Pre-Scrubber, an amine based Cansolv Regenerative Wet Gas Scrubber with caustic polisher, hereafter all components are collectively referred to as "the FCCU WGS System" at the Delaware City Refinery, 4550 Wrangle Hill Road in Delaware City, Delaware in accordance with the following:

- Application submitted on Form Nos. AQM-1, AQM-2, AQM-3.1, AQM-4.9 and AQM-5 dated December 16, 2014 signed by Jose Dominguez.
- Electronic mail with attachment from Larry Boyd to Ravi Rangan dated April 21, 2015 detailing FCCU SNCR NH₃ emissions.
- Electronic mail from Larry Boyd to Ravi Rangan dated April 22, 2015 with comments on the FCCU SNCR Draft Permit.
- Letter from Larry Boyd to Ravi Rangan dated March 13, 2017 detailing compliance methodology for HCN emissions during full burn operation.
- Settlement Agreement dated July 11, 2019.

This permit is issued subject to the following conditions:

1. **General Provisions**

- 1.1. This permit expires five years from the date of issuance.
- 1.2. Representatives of the Department may, at any reasonable time, inspect this facility.
- 1.3. This permit may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. A request for a permit

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transfer shall be received by the Department at least 30 days before the date of the requested permit transfer. This request shall include:

1.3.1 Signed letters from each person stating the permit transfer is agreeable to each person; and

1.3.2 An Applicant Background Information Questionnaire pursuant to 7 Del. C., Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous 5 years.

Approval (or disapproval) of the permit transfer will be provided by the Department in writing.

1.4. The owner or operator shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 DE Admin. Code 1102, and, when applicable 1125, and receiving approval of such application from the Department; except as authorized by this permit or exempted in the Regulations.

1.5 The Company shall, upon completion of the construction, installation, or alteration of each emission unit, request in writing that the Department transfer the terms and conditions of this permit into the 7 **DE Admin. Code** 1130 operating permit. *[Reference 7 DE Admin. Code 1102 Section 11.5 dated 06/11/2006]*

1.6 The request shall contain the following information, and shall contain the following language from the responsible official: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete." *[Reference 7 DE Admin. Code 1102 Section 11.5.1 dated 06/11/2006]*

1.6.1 A description of the compliance status, a complete schedule, and a certification of compliance for the equipment, facility, or air contaminant control device with respect to all applicable requirements, in accordance with 7 **DE Admin. Code** 1130 Section 5.4.8 and 5.4.9; and

1.6.2 A statement of the methods used to determine compliance, including a description of the monitoring, record keeping, and reporting requirements and test methods.

1.7 Upon satisfactory demonstration that the equipment, facility, or air contaminant control device complies with all applicable requirements and all terms and conditions of the construction permit, and not prior to the expiration of the EPA review period provided for in 7 **DE Admin. Code** 1102, Section 12.5, the Department shall transfer the specified terms and conditions to the 7 **DE Admin. Code** 1130 permit via the administrative amendment process specified in 7 **DE Admin. Code** 1130. *[Reference 7 DE Admin. Code 1102 Section 11.5.2 dated 06/11/2006]*

2. **Emission Limitations**

2.1. Air contaminant emission levels from the FCCU WGS System through the WGS stack¹ shall not exceed those specified in the Regulations at 7 DE Admin. Code 1100, *et. seq.* and the following²:

2.1.1. **Volatile Organic Compound (VOC) Emissions**

2.1.1.1. VOC emissions shall not exceed 0.40 lb/mmdscf and 41.4 TPY.

2.1.1.2. The leak detection and repair requirements to control fugitive VOC emissions from the FCCU shall be in accordance with the requirements in 40 CFR 60, Subpart GGG for existing components in light liquid and gaseous service and in accordance with 40 CFR part 63 subpart CC for new components in light liquid and gaseous service. The leak detection and repair requirements to control fugitive emissions from the FCCU shall be in accordance with the Consent Decree for both new and existing components in light liquid and gaseous service.

2.1.2. **Nitrogen Oxide (NOx) Emissions**

2.1.2.1 NOx emissions shall not exceed those prescribed in Condition 3, Table 1e.4.i of **Permit: AQM-0003/00016-Part 2 (Renewal 1)(Revision2)** dated April 12, 2018.

2.1.2.2 NOx emissions shall not exceed the following at all times:

2.1.2.2.1 137.0 ppmvd @ 0% oxygen on a 7-day rolling average basis.

2.1.2.2.2 100.7 ppmvd @ 0% oxygen on a 365-day rolling average basis.

2.1.2.3 NOx emissions shall not exceed those achieved by proper operation of the SNCR as follows:

2.1.2.3.1 108.2 ppmvd @ 0 % oxygen on a 7-day rolling average basis.

2.1.2.3.2 79.6 ppmvd @ 0 % oxygen on a 365-day rolling average basis.

2.1.3. **Particulate Matter (TSP/PM₁₀)**

Particulate matter emissions shall not exceed 1 lb/1000 lb of coke burned and 203 TPY.

2.1.4 **Sulfuric Acid (H₂SO₄) Emissions**

H₂SO₄ emissions shall meet one of the following standards:

2.1.4.1 H₂SO₄/SO₃ emissions shall be reduced by at least 40% across the wet gas scrubber system; or

2.1.4.2 The outlet concentration of H₂SO₄/SO₃ from the stack shall be no greater than 10 ppmvd.

2.1.5 **Sulfur Dioxide (SO₂) Emissions**

¹ This permit specifically does not authorize any emissions through the Goggle valve and its bypass stack.

² Tons per year (TPY) is defined as "tons per rolling twelve months" unless otherwise specified.

SO₂ emissions shall not exceed 25 ppmvd @ 0% O₂ on a rolling 365 day average, 50 ppmvd @ 0% O₂ on a rolling 7 day average, and 352 TPY.

2.1.6 Carbon Monoxide (CO) Emissions

2.1.6.1 CO emissions shall not exceed 500 ppmvd as a 1 hour average and 3,085 TPY.

2.1.6.2 The Company shall not cause or allow the emission of carbon monoxide from the FCCU unless it is burned at no less than 1300°F for at least 0.3 seconds in the FCCU COB, or combusted in the FCCU regenerator when operating in full-burn mode.

2.1.7 Lead (Pb) Emissions

Pb emissions shall not exceed 4.37 E-04 pounds per thousand pounds of coke burned.

2.1.8 Hazardous Air Pollutant (HAP) Emissions

2.1.8.1 The Company shall comply with all the applicable requirements of 40 CFR Part 63, subpart UUU.

2.1.8.2 Hydrogen Cyanide (HCN): HCN emissions from the FCCU WGS shall not exceed 45 lb/hr.

2.1.9 Ammonia (NH₃) Emissions:

NH₃ emissions shall not exceed 8.5 lb/hour and 37 TPY

2.2. The opacity from the FCCU WGS stack shall not be greater than 20% opacity for an aggregate of more than 3 minutes in any 1 hour or more than 15 minutes in any 24 hour period.

2.3. Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.

2.4. In the event that the FCCU COB is bypassed and/or shut down, operation of the FCCU shall be in accordance with Attachment "A" of this permit.

In the event of a planned shutdown of the CO Boiler or in the event of planned operation of the CO Boiler at firebox temperatures less than 1300 deg F, the Owner/Operator shall initiate promoted burn in the FCCU and control CO emissions in accordance with Condition 3, Table 1.e.5.i of **Permit: AQM-003/00016** prior to bypassing/shutting down the CO Boiler and/or reducing firebox temperature below 1300 deg F in the CO Boiler.

2.5. The emission limitations in Condition 2.1 with the exception of Conditions 2.1.3, 2.1.4 and 2.1.5, shall not apply during periods when the FCCU COB is combusting refinery fuel gas only and during periods of planned shut downs and planned start ups of the FCCU for a period of time not to exceed 80 hours for each planned shut down and each planned start up event. The planned shut down period shall begin 8 hours prior to the time when there is no feed entering the FCCU reaction section. The planned start up period shall begin

when dry-out of the FCCU is commenced. The emission limitations in Condition 2.1 shall apply to each planned start up event after the expiration of the 80 hour period following commencement of FCCU dry-out. In lieu of the emission limitations in Condition 2.1, the following emission limitations shall apply during periods when the FCCU COB is combusting refinery fuel gas only and during planned start ups and shut downs of the FCCU:

- 2.5.1. VOC 9.5 lbs/hr
- 2.5.2. PM 500 lbs/hr
- 2.5.3. SO₂ 165 lbs/hr
- 2.5.4. CO 860 lbs/hr

Compliance with these emission limitations shall be determined based on engineering calculations.

3. Operational Limitations

3.1. The Company shall comply with the following operational limits:

- 3.1.1. With the exception of regenerator process offgas, the Company shall not burn any fuel in the FCCU COB that contains hydrogen sulfide (H₂S) in excess of 0.10 gr/dscf (162 ppm);
- 3.1.2. Except as provided in Condition 3.2, the COB, the Belco pre-scrubber, the amine-based Cansolv regenerative WGS, and the caustic polishing scrubber shall be operating properly at all times when the FCCU is operating.
- 3.1.3. During planned start ups of the FCCU, the FCCU COB and WGS shall be operating prior to introducing feed into the riser reactor of the FCCU. In the event of a planned shut down of the FCCU, the FCCU COB or the WGS, the Company shall continue to operate the FCCU COB and WGS until there is no feed entering the riser reactor of the FCCU prior to commencing shut down of the FCCU COB and the WGS.

These planned start up and shut down provisions will not apply to the COB if the FCCU regenerator is operating in full burn mode.

3.1.4. SNCR Operation

- 3.1.4.1 Except as provided by Condition 3.1.4.3, the FCCU COB shall not be operated while in partial burn mode unless the SNCR system is in use and operating properly whenever the SNCR system is available. Compliance with the emission limitations in 2.1.2 shall constitute proper operation.
- 3.1.4.2 The owner or operator shall operate the SNCR system in accordance with manufacturer's recommendations and shall be operated at all times that it is available.

- 3.1.4.3 The SNCR system is considered available except during periods of planned maintenance or malfunction as defined in Condition 3.1.4.4
 - 3.1.4.4 "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner, and that causes the source to exceed a technology based emission limitation under the permit, due to unavoidable increases in emissions attributable to the malfunction. An emergency or malfunction shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.
- 3.2 Except as provided in Condition 2.4, this Permit does not authorize emissions exceeding the limits set forth in Condition 2 including emissions during periods of any unplanned shutdown of the FCCU, or any unplanned shutdown or bypass of the FCCU COB and SNCR, or the Belco prescrubber or WGS system. Instead, in the event of any unplanned shutdown of the FCCU or any unplanned shutdown or bypass of the FCCU COB and SNCR or Belco prescrubber or the WGS system, the Company shall bear the burden of demonstrating to the Department's satisfaction that the Company's continued operation of the FCCU should not subject the Company to an enforcement action for noncompliance with emission limitations or operating standards included in this Permit or otherwise applicable to the facility under 7 **DE Admin. Code** 1100. Such demonstration must at a minimum be supported by sufficient documentation and emissions data including all relevant emissions calculations, formulas, and any assumptions made thereof. The Department's evaluation shall consider, the specific circumstances of the event, including without limitation 1) the cause of, and the Company's response to, the unplanned shutdown; 2) whether the Company has taken all reasonable and prudent steps to abide by the emissions limit conditions; 3) whether the Company has taken all reasonable and prudent steps to minimize the emissions associated with the plant; 4) the degree to which the Company has reduced throughput to the FCCU, and the basis for such degree of reduction; 5) the estimated emissions associated with a complete shutdown of the FCCU; 6) whether the Company had reviewed all prior similar causes of unplanned shutdowns and had taken all reasonable and prudent actions necessary to avoid future similar outages; and 7) the actual emissions during the period of the unplanned shutdown.
- 3.3 There shall be no emissions of uncondensed VOCs from the condensers, hot wells or accumulators of any vacuum producing system.
- 3.4 During process unit turnarounds the Company shall provide for the following:
 - 3.4.1 Depressurization venting of the process unit or vessel to a vapor recovery system, flare, or firebox.
 - 3.4.2 No emission of VOC from a process unit or vessel until its internal pressure is 136 kiloPascals (kPa) (19.7 pounds per square inch atmospheric [psia]) or less.
- 3.5
 - 3.5.1 At all times, including periods of startup, shutdown, and malfunction, the Company shall, to the extent practicable, maintain and operate the facility including all associated air pollution control equipment in a manner consistent with good air pollution control practices for minimizing emissions.

3.5.2 All structural and mechanical components shall be maintained in proper operating condition.

4. Compliance Methodology

- 4.1. Compliance with Conditions 2.1.1.1 (VOCs), 2.1.3 (TSP/PM₁₀), 2.1.4 (H₂SO₄), 2.1.7 (Pb), 2.1.8.1 (HAPs) and 2.1.9 (NH₃) shall be based on stack testing to be conducted in accordance with Condition 5 of this permit. The Company shall ensure adequate test ports are provided to carry out such testing in accordance with Regulation No. 17 section 2.3 in the exhaust stack, and upstream of the Belco pre-scrubber in accordance with EPA RM 1 of 40 CFR Part 60, Appendix "A" to ensure representative isokinetic sampling.
- 4.2. Compliance with Condition 2.1.1.2 for new components in light liquid and gaseous service shall be based on compliance with the standards in 40 CFR 63.162 through 63.177.
- 4.3. Compliance with Conditions 2.1.2, 2.1.5, 2.1.6.1, and 3.1.1 shall be based on continuous monitoring systems.
- 4.4. Compliance with Condition 2.1.6.2 is defined as maintaining a firebox temperature of no less than 1300° F as measured on a minute average basis.
- 4.5. Compliance with Condition 2.1.8.2 shall be based on compliance with Condition 2.1.6.1.
 - 4.5.1 Alternatively, during startup, shutdown, malfunction and hot standby events, compliance may be demonstrated based on the work practice standard to maintain the Oxygen (O₂) concentration in the exhaust gas from the regenerator overhead at or above 1 volume percent (dry basis).
- 4.6. Compliance with Conditions 3.1.2 and 3.1.3 shall be based on the monitoring/testing and recordkeeping requirements.
- 4.7. Compliance with Conditions 3.4 shall be based on either piping the uncondensed vapors to a firebox or incinerator. Alternately, the vapors may be compressed and added to the refinery fuel gas. During process unit turnarounds, the Company shall conduct depressurization venting of the process unit or vessel to a vapor recovery system, flare or firebox. The Company shall monitor the pressure in each process or vessel until its internal pressure is 136kPa or less. These actions shall be documented.
- 4.8. Compliance with the standards in 40 CFR subpart GGG shall be based on the test methods and procedures in 40 CFR 60.592 and compliance with the requirements of 40 CFR Part 63 subpart CC shall be based on the standards in 40 CFR 63.648.
- 4.9. Compliance with Condition 3.5 shall be based on information available to the Department concerning the Company's actions with respect to such events, and shall include the Department's review of all available facts and circumstances including, but not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

5. **Testing and Monitoring Requirements**

- 5.1 Within 60 days after achieving the maximum production rate at which the facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator shall conduct performance test(s) and furnish the Department with a written report of the results of such performance test(s) in accordance with the following general provisions:
- 5.1.1 One original and 2 copies of the test protocol including a "Source Sampling Guidelines and Preliminary Survey Form" shall be submitted a minimum of 30 days in advance of the tentative test date to the address in Condition 6.3. The tests shall be conducted in accordance with the State of Delaware and Federal requirements.
- 5.1.2 The test protocol shall be approved by the Department prior to initiating any testing. Upon approval of the test protocol, the Company shall schedule the compliance demonstration with the Air Surveillance and Engineering & Compliance Branches. The Department must observe the test for the results to be considered for acceptance, unless the Department determines in advance, in writing, that the test need not be observed. Further, the Department may in its discretion determine based on its observation of the test that it need not observe the entire test.
- 5.1.3 The final results of the testing shall be submitted to the Department within 90 days of the test completion. One original and 2 copies of the test report shall be submitted to the addresses below:
- | | |
|----------------------------------|---------------------------|
| <u>Original and One Copy to:</u> | <u>One Copy to:</u> |
| Engineering & Compliance Branch | Air Surveillance Branch |
| Attn: Assigned Engineer | Attn: Stack Test Engineer |
| 100 W. Water Street, Suite 6A, | 715 Grantham Lane |
| Dover, DE 19904 | New Castle, DE 19720 |
- 5.1.4 To be considered valid, the final results report shall include the emissions test report (including raw data from the test) as well as a summary of the results and a statement of compliance or non-compliance with permit conditions signed by a member of the Company's Health, Safety and Environment department.
- 5.1.5 The results must demonstrate to the Department's satisfaction that the emission unit is operating in compliance with the applicable regulations and conditions of this permit; if the final report of the test results shows non-compliance the owner or operator shall propose corrective action(s). Failure to demonstrate compliance through the test may result in enforcement action.
- 5.2 The QA/QC procedures for the SO₂ CEMS shall be established in accordance with the procedures in Appendix "F" of 40 CFR Part 60. For the purpose of determining the Relative Accuracy of the CEMS, the applicable standard shall be 25 ppmvd.
- 5.3 The NO_x CEMS shall be installed and certified by satisfying the requirements of the applicable Performance Specifications in Appendix "A" of 40 CFR Part 60. The QA/QC procedures for the CEMS shall be established in accordance with the procedures in Appendix "B" of 40 CFR Part 60.

- 5.4 Compliance with PM₁₀ emission limits shall be based on performance testing conducted in accordance with Condition 5.1 and annually thereafter, as follows:
- 5.4.1 H₂SO₄: Compliance with emission limits set in accordance with Conditions 2.1.3.1 and 2.1.4 shall be based on testing in accordance with Reference Method 8 in Appendix "A" of 40 CFR Part 60, or other testing methodology approved by the Department.
 - 5.4.2 TSP: Compliance with Condition 2.1.3 shall be based on testing in accordance with Reference Method 5B in Appendix "A" of 40 CFR Part 60, or other testing methodology approved by the Department.
 - 5.4.3 PM₁₀: Compliance with emission limits set in accordance with Condition 2.1.3 shall be based on testing in accordance with Methods 5B/202, or other testing methodology approved by the Department.

The Company may petition the Department to decrease the frequency of PM₁₀ performance tests based on the results of any performance testing.

- 5.5 CO: Compliance testing shall be based on CEMS. The CEMS shall be installed and certified by satisfying the requirements of Performance Specifications No. 4 in Appendix "B" of 40 CFR Part 60. The QA/QC procedures for the CEMS shall be established in accordance with the procedures in Appendix "F" of 40 CFR Part 60.
- 5.6 VOC as CH₄: Compliance testing shall be based on Reference Method 25 A in Appendix "A" of 40 CFR Part 60 every three years thereafter. The Company may petition the Department to decrease the frequency of VOC performance tests based on the results of any performance testing
- 5.7 Pb: Compliance shall be based on the stack test based emission factor in terms of lb/1,000 lb coke burn rate. The Company shall conduct additional performance testing in accordance with this condition every three years, unless the Department approves less frequent testing.
- 5.8 The Company shall continuously monitor the temperature of the FCCU COB firebox.
- 5.9 The Company shall continuously monitor the pressure drop across the Agglo-filtering modules and Cyclolab Droplet Separators and the quench/pre-scrubber recirculation pump discharge pressure. The determination that the opacity from the FCCU WGS stack, when it is operating, satisfies the requirements of Condition 2.2 shall be based upon the following parametric monitoring:
- 5.9.1 The minimum delta-P across the Agglo-Filtering modules and Cyclolab Droplet Separators shall be 6 inches of water column, evaluated on a one minute average basis; and
 - 5.9.2 A minimum discharge pressure, evaluated on a one minute average basis, from the quench/pre-scrubber recirculation pumps satisfying the less stringent of:
 - 5.9.2.1 115 psig, or
 - 5.9.2.2 The discharge pressure equivalent to 95% of the average discharge pressure recorded during performance testing performed in accordance with the methods identified in Condition 5.4, provided that such

performance testing also includes a demonstration of compliance with the visual emissions standard identified in Condition 2.2 using EPA Method 9.

- 5.9.3 Notwithstanding Condition 5.9.1 and Condition 5.9.2, if either the differential pressure across the Agglo-Filtering Modules/Cyclolab Droplet Separators or the discharge pressure from the quench/prescrubber falls below the minimum levels established under Conditions 5.9.1 and 5.9.2 for greater than 3 minutes in any hour or more than 15 minutes in any 24 hour period, the Company may perform a visual emission test in accordance with EPA Reference Method 9 to establish that the visible emissions do not exceed the opacity standard specified in Condition 2.2 at the reduced parameter level. In such a case, the new minimum value for the parameter in question shall be the average value recorded during the Method 9 test, and shall be used in conjunction with Condition 5.9.1 to evaluate compliance with Condition 2.2.
- 5.9.4 During periods of full burn operation with the COB bypassed or the COB operating at a reduced level, if visible emissions are observed to be greater than 20% opacity, the Company shall perform a visual emission test in accordance with EPA Reference Method 9 to establish that the visible emissions do not exceed the opacity standard specified in Condition 2.2.
- 5.10 All monitor certifications shall be conducted within 60 days of the unit attaining maximum production but not later than 180 days after unit start up. A "Source Sampling Guidelines and Preliminary Survey Form" must be submitted and found acceptable to the Department at least 30 days prior to the performance testing. Results of the Performance Specification testing shall be submitted to the Department, in triplicate, within 90 days after completion of the testing.

6. Record Keeping Requirements

- 6.1. The Company shall maintain all records necessary for determining compliance with this permit in a readily accessible location for 5 years and shall make these records available to the Department upon written or verbal request. These records shall include:
 - 6.1.1. CEMS data;
 - 6.1.2. Calibration and audit results;
 - 6.1.3. Stack test results;
 - 6.1.4. The daily FCCU COB fuel usage;
 - 6.1.5. FCCU COB firebox temperature;
 - 6.1.6. Detailed daily records of observations of visible emissions or the absence of visible emissions, or daily visible emissions observations, or other records identified in an approved alternative plan;
 - 6.1.7. Date of each FCCU process unit or vessel turnaround;
 - 6.1.8. Date and duration of seamless bypass operation;
 - 6.1.9. Internal pressure of the process unit or vessel immediately prior to venting to the atmosphere; and
 - 6.1.10. VOC leak repair records required by 40 CFR 60.592 for existing components in light liquid and gaseous service and 40 CFR 63.654 for new components in light liquid and gaseous service.

- 6.2. The rolling 12 month total emissions for each pollutant shall be calculated and recorded for each month in an easily accessible format for each pollutant listed in Condition 2.1.

7. Reporting Requirements

- 7.1. Emissions in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department immediately upon discovery by calling the Environmental Emergency Notification and Complaint number, (800) 662-8802.
- 7.2. In addition to complying with Condition 7.1 of this permit, the Company shall satisfy any reporting required by the "Reporting of a Discharge of a Pollutant or an Air Contaminant" Regulation, within 30 calendar days of becoming aware of an occurrence subject to reporting pursuant to Condition 7.1. Further the Department may in its discretion require the Company to submit reports not otherwise required by the Regulation. All reports submitted to the Department pursuant to this Condition shall be submitted in writing and shall include the following information:
- 7.2.1. The name and location of the facility;
- 7.2.2. The subject source(s) that caused the excess emissions;
- 7.2.3. The time and date of the first observation of the excess emissions;
- 7.2.4. The cause and expected duration of the excess emissions;
- 7.2.5. For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
- 7.2.6. The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
- 7.2.7. Emissions on the same day from the same emission unit may be combined into one report. Emissions from the same cause that occur contemporaneously may also be combined into one report.
- 7.2.8. The Company shall submit an electronic copy of all required reports to the Department's compliance engineer assigned to the Refinery.
- 7.3. Semiannual reports for the preceding six month period shall be submitted to the Department by January 31 and July 31 of each calendar year. The semiannual reports required by this section shall be increased in frequency to quarterly reports at the Department's discretion and shall become effective upon request of the Department after reasonable notice to the Company. An electronic copy of all required reports shall be sent to the Department's compliance engineer assigned to the Refinery. The required reports shall contain the following information:
- 7.3.1. A summary of all excess emissions for the six month period;
- 7.3.2. Periods when the FCCU COB firebox temperature fell below 1300° F; and
- 7.3.3. The duration and magnitude of all periods of excess opacity;
- 7.4. Quarterly NO_x CEMS reports for the preceding quarter shall be submitted to the Department for the CEMS required by this permit by January 31, April 30, July 31 and October 31 of each calendar year and shall include the following:
- 7.4.1. Excess emissions and the nature and cause of the excess emissions, if known. The summary shall consist of emission averages, in the units of the applicable

standard, for each averaging period during which the applicable standard was exceeded.

- 7.4.2. The date and time identifying each period during which the continuous monitoring system was inoperative, except for zero and span checks, and the nature of system repairs or adjustments.
- 7.4.3. When no excess emissions have occurred and the CEMS have not been inoperative, repaired, or adjusted, such information shall be included in the report.
- 7.5. Quarterly SO₂ and CO CEMS reports for the preceding quarter shall be submitted to the Department by January 30, April 30, July 30 and October 30 of each calendar year and shall include the information required by 40 CFR 60.7(c) and (d).
- 7.6. Annual compliance test reports shall be submitted to the Department within 90 days of completion of the test.
- 7.7. VOC leak repair records shall be submitted to the Department as required by 40 CFR 60.592 for existing components in light liquid and gaseous service and 40 CFR 60.654 for new components in light liquid and gaseous service.
- 7.8. One original of all required reports in hard copy format shall be sent to the address below:

Air Quality Management Section
Division of Air Quality
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

One copy of all required reports in hard copy format shall be sent to the address below:

Compliance Engineer
Engineering & Compliance Branch
715 Grantham Lane
New Castle, DE 19720

Permit: APC-82/0981-OPERATION (Amendment 13)(NSPS)(FE)
Delaware City Refining Company
FCCU, FCCU COB, FCCU COB SNCR System and Wet Gas Scrubber System
October 21, 2019
Page 13

8. **Administrative Conditions**

- 8.1. This permit shall be made available on the premises.
- 8.2. This permit authorizes the operation of the equipment authorized to be constructed by **Permit: APC-82/0981-CONSTRUCTION (Amendment 12)(NSPS)** dated April 23, 2015 and supersedes **Permit: APC-82/0981-OPERATION (Amendment 12)(NSPS)** dated March 23, 2017.
- 8.3. Failure to comply with the provisions of this permit may be grounds for suspension or revocation.

Sincerely,



Angela D. Marconi, P.E.
Acting Program Manager
Engineering & Compliance Branch

ADM:LTR
F:/EngandCompliance/LTR/ltr19053.doc

pc: Dover Tile V File
Mark J. Lutrzykowski, P.E.
Dawn Minor
Lindsay Rennie

ATTACHMENT "A"

CO Boiler Bypass Events – Conversion to Full Burn

The procedures described herein shall apply during periods of transition when the CO Boiler experiences an unplanned start-up or shut-down event.

Rationale:

DCRC is installing a bypass line around the CO boiler to allow for regenerator flue gas to be treated in the wet gas scrubber (WGS) during periods when the CO boiler is not available or otherwise out of service. When the regenerator flue gas is bypassing the CO boiler, the FCCU will be converted to operate in full burn to minimize CO emissions. However, if the CO boiler were to shutdown unexpectedly, it is not possible to instantaneously convert the regenerator from partial burn operation to full burn operation and, thus, the following provisions address the operation of the FCCU during such transition periods.

Interim Control Measures

The Owner/Operator shall comply with the following interim control measures:

1. Unplanned Start-up and Shutdown of Fluid Catalytic Cracker Unit CO Boiler. In the event that the FCCU COB is to be shut down for a period longer than 24 hours, DCRC shall promptly begin necessary process changes to provide for the complete combustion of carbon monoxide. Full CO combustion operation shall be achieved within 24 hours.
2. If there is an emergency shutdown of the FCCU CO Boiler due to upsets or malfunctions, the refinery will take the following steps:
 - Open the bypass line to allow for treatment of regenerator flue gases in the wet gas scrubber;
 - Immediately begin the necessary process changes to allow for the complete combustion of carbon monoxide in the regenerator; and
 - FCCU throughput and operating conditions will be safely adjusted as necessary (see FCCU Turndown Factor below) to allow full CO combustion operation to be achieved within 24 hours of attainment of appropriate operating conditions.

If there is an unplanned or emergency shutdown of the FCCU CO Boiler, the refinery will conduct an evaluation of the cause of the shutdown. If the CO Boiler can be repaired and brought back on line in less than 24 hours, then the regenerator flue gas may continue to bypass the COB to allow it to be repaired or restarted, and combustion promoter need not be added. Until the FCCU CO boiler is returned to normal operation or until full promoted burn conditions are established in the regenerator, in order to minimize FCCU CO emissions, the FCCU feed rate will be reduced to the minimum operating rate as described in the FCCU Turndown Factor below. During this period (24 hours maximum), the requirements in Condition 2.1.6 and 7 **DE Admin. Code 1111** shall not apply.

FCCU Turn Down Factor

These procedures have been incorporated to minimize FCCU CO emissions during time periods that the FCCU COB is bypassed.

1. If the Company's initial assessment indicates that the FCCU COB can be returned to service within 24 hours after the unplanned shutdown or emergency shutdown, or full combustion of CO has been achieved to meet applicable emission limits, then no rate cuts will be initiated and combustion promoter need not be added. The FCCU may continue to operate until the COB is restarted.
2. If the Company's initial assessment indicates that the FCCU COB cannot be returned to service within 24 hours after the unplanned or emergency shutdown, the Company shall take the following actions:
 - a. The Company will promptly begin to reduce the FCCU feed rate at a rate of 5,000 bph until the unit is operating at 55,000 bpd; and
 - b. Combustion promoter will be added to the FCCU regenerator when appropriate operating conditions have been achieved. Fully promoted (complete) combustion will be achieved within 24 hours of the start of the unplanned or emergency shutdown.